

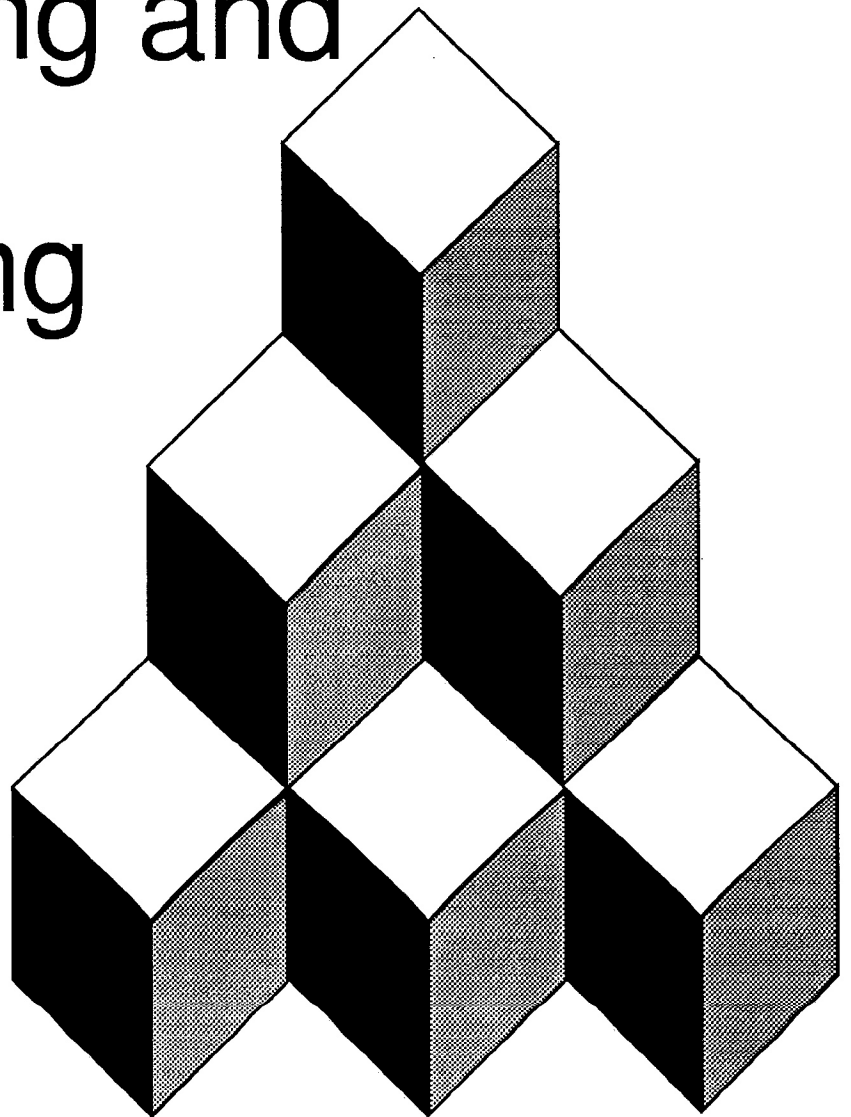


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Tools for Active Teaching and Active Learning



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Computer Concepts

For Apple // Series Computers

Ventura Educational Systems

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Computer Concepts

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Introduction

Computer Concepts is an interactive learning system that has been designed to provide 7th grade enrichment through adult level instruction in computer literacy. Several approaches to computer literacy instruction are combined in the design of this educational software package. The complete Apple // Series version of Computer Concepts is provided on one 5.25" 140K diskette. Computer Concepts contains an Identification Game, a Data Retrieval Utility, and a Quiz Machine for each topic.

With the Computer Concepts program each topic can be studied using an Identification Game where the object is to identify a computer term and its associated key concept, a Data Retrieval Utility where terms and key concepts are accessed, or a Quiz Machine where practice matching terms and key concepts is provided. With the Identification Game students practice recognizing important terms and key concepts using a part of a computer graphic as a clue to the term or key concept. It can be used as a 'discovery learning' type of activity for students who are unfamiliar with the terms and key concepts or can be used for reinforcement after the terms and key concepts have been introduced. The Data Retrieval Utility is a computerized reference system that allows students to review terms and key concepts and to read detailed descriptions that explain the significance of the term or key concept as it pertains to computer literacy. The Quiz Machine presents a term and asks the student to select the related key concept.

The instructional goals of Computer Concepts are given in these objectives:

1. To provide practice identifying and matching terms and related key concepts relevant to computer literacy by using a visual clue given in a graphic representation.
2. To provide on-line reference material pertaining to important terms and the associated key concepts for use in the computer literacy classroom, library or computer laboratory setting.
3. To support the development of a student's sense of confidence in his/her ability to understand computer terminology by measuring and reporting the student's progress toward understanding the topics presented in each unit using points and a percentage correct rating.

Computer Concepts

The main topics covered by this learning system are listed below:

Computer History
How a Computer System Works
BASIC Statements
Understanding Flowcharts
Computer Uses

Computer Concepts can be used in combination with other instructional approaches and closely parallels the computer literacy curriculum taught in most secondary schools. The program provides students with the opportunity to review and explore the concepts learned in computer classes. The format of the system is designed to make learning fun. Each topic can be studied in a variety of ways. A quiz for each computer topic assesses the student's mastery of the material and helps to provide reinforcement. The system maintains a record of the student's performance on a disk and can be utilized by the teacher during instructional planning.

Computer Concepts is useful as a supplement for most introductory level computer literacy students. Much of the confusion that students feel in computer classes is due to an inability to understand the terminology used to describe the computer system and functions. Computer Concepts is an effective tool for mastering the vocabulary of computer literacy.

With Computer Concepts, students enjoy learning the ideas that are essential for success in higher level computer courses. The program is an effective way to introduce students to computer terms and concepts and can also be used as a tool to provide reinforcement.

Supplementary materials are provided in this manual and are designed to be used in conjunction with the computer activities. The supplementary worksheets may be duplicated for classroom use and lab packs with multiple copies of the program disks are available from the publisher.

Credits

Software Design

Ventura Educational Systems

Instructional Technology
and Programming

Fred Ventura, Ph.D.

Editor

Marne Ventura, M.A.

Dr. Fred Ventura is an experienced classroom teacher and has taught elementary, secondary and college levels. He holds a doctorate in education from the University of California, and presents workshops for educators on the instructional uses of microcomputers.

Marne Ventura is also an experienced classroom teacher and holds a masters degree in reading and language development from the University of California. As a seminar leader, Marne Ventura has assisted many teachers in learning about the educational opportunities that can be derived from the use of microcomputers in the classroom.

Other Publications Include:

SuperGraph

GeoArt: Geometry and Art Discovery Unit

Marine Life: Anatomy of a Fish

Anatomy of a Sea Lamprey

Senses: Physiology of the Human Sense Organs

The Plant: Nature's Food Factory

Chemaid: Introduction to the Periodic Table

The Worm: Invertebrate Anatomy

Protozoa: Introduction to Microorganisms

States: Geography Study Unit and Database

All About the Solar System

All About Simple Machines

Dr. Know: Experiments in Artificial Intelligence

Coordinate Geometry

Geometry Concepts

Marine Invertebrates

Anatomy of a Shark

VisiFrog: Vertebrate Anatomy

Music Concepts

Plant and Animal Cells

The Insect World

All About Matter

All About Light & Sound

Additional Program Disks

Many schools have more than one computer and to effectively use educational software require additional legal copies of a program. Additional program disks are available for use in a computer lab. The price is \$10.00 per disk. Schools with a registered copy of any Ventura Educational Systems product may order additional copies of a program disk at any time. There is a 30 day warranty on original program disks. If for any reason a program disk becomes defective within 30 days of the date of purchase, Ventura Educational Systems will replace it at no charge.

Computer Concepts

An Overview of the Computer Concepts Learning System

Computer Concepts combines a variety of instructional techniques in an easy-to-use learning system. First time users can opt to begin with the Identification Game and learn the terminology and related concepts in a 'discovery learning mode' or may decide to use the Data Retrieval Utility to scan the Computer Concepts database. The Quiz Machine challenges the student to match the terms and key concepts. The program monitors student performance reports the scores attained using the identification game and quiz portions of the program.

Text and graphics are interactively presented during the use of this program. Activity pages are provided in this manual and are designed to be used in conjunction with the use of the computer and as follow-up. Teachers are encouraged to duplicate the supplementary materials for classroom use.

In the quiz mode the computer's random number generating ability is employed to generate a unique mix of possible answers. The quiz can be set up so that students match terms with key concepts or key concepts with terms.

A Conceptual Framework for Computer Concepts

Learning the terminology of computer literacy is an important goal because terminology is an essential element in building a foundation for computer science. A strong foundation is necessary for success in the study of advanced computer topics where knowledge and skills are put to use in a variety ways.

The study of computer science is most exciting when students are able to proceed at their own pace, taking time to explore concepts and experiment with the ideas that are being learned. The computer can be used to assist the learning process by providing a wealth of information and by providing a structure for experimentation.

The philosophical approach taken in the design of Computer Concepts is to provide a computer based learning environment for studying computer terms and their related key concepts. For each topic the student has the opportunity to play an identification game, read information, or take a quiz. The results of the game and quiz are stored in the student's file and can be reported on the screen or on the printer.

The first topic is Computer History. Here the student will learn about the major events in the history of computer technology. The second topic, How a Computer System Works, explains the main components of a computer system and how they are integrated in the data processing cycle. The third topic, BASIC Statements, covers some of the most often used programming statements and is used to develop an understanding of how the statements function in a program. Understanding Flowcharts is the fourth topic. The activities associated with this topic lead to an understanding of how flowchart symbols are used to represent the logic of a program. The fifth topic is Computer Uses. Here students learn the variety of ways that computers are used in society.

Materials and System Requirements

The Computer Concepts learning system includes these components:

Computer Concepts Program Disk (DOS 3.3 Format)
Documentation: A Teacher's Guide
with Reproducible Black Line Masters

The minimum system configuration is:

Apple // Plus, Apple //e, Apple //c or Apple //gs,
Color Graphics Monitor (preferred)
Single Disk Drive

Getting Started

To start Computer Concepts simply insert the program disk and turn on the computer. For the program to work correctly it is necessary for the system to boot from the Computer Concepts program disk. After a few seconds the activity menu will appear.

Computer Concepts

Activity Menu

The Activity Menu offers these choices:

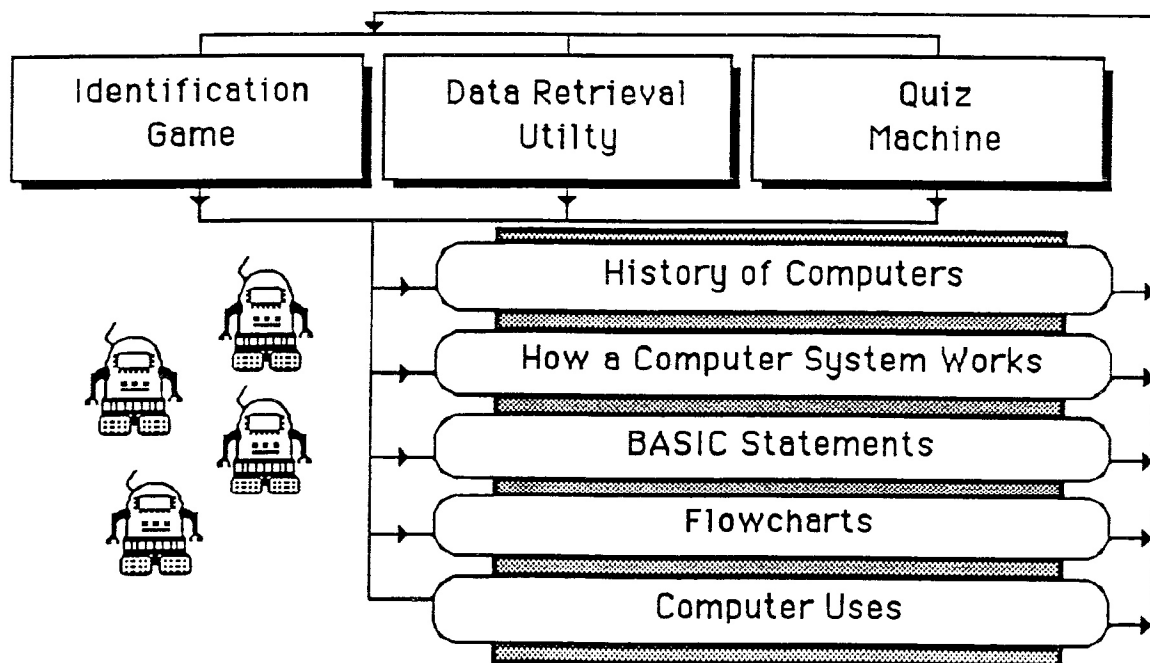
**** Ventura Educational Systems ****
Computer Concepts

- 1 --- Identification Game
- 2 --- Data Retrieval Utility
- 3 --- Quiz Machine

Selection: /

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To make a choice from this menu press the number corresponding to the choice. The main menu is followed by the topic menu.



Topics Menu

Computer Concepts is organized around seven topics. Each of the seven topic areas can be studied in a variety of ways. The Topic Menu presents a list of topics. To select a topic move the indicator using the arrow keys to the desired topic and press return.

Computer Concepts

- Computer History
- How a Computer System Works
- Basic Statements
- Understanding Flowcharts
- Computer Uses

ARROWS OR RETURN

Instructions for Using the Identification Game

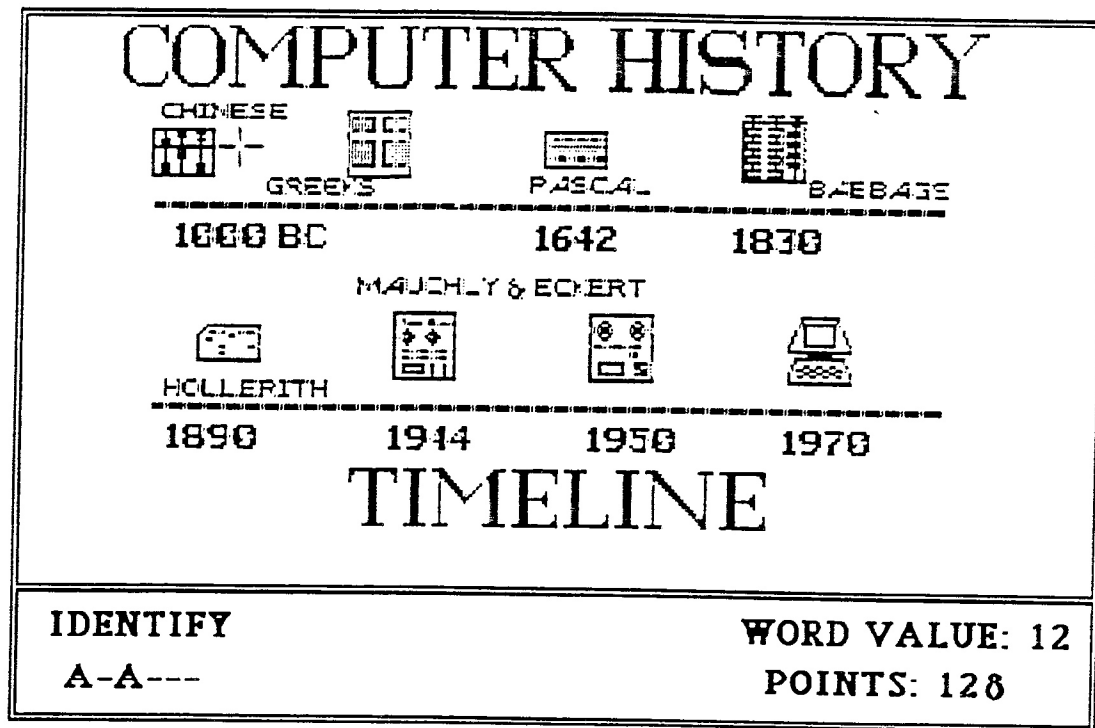
The Identification Game provides motivating practice in identifying terms and concepts that are represented in a computer diagram. To study a particular topic select the topic from the Topic Menu.

When the Identification Game is selected from the Activities Menu a graphic screen for the current topic is presented. An indicator appears on the screen marking a part of the diagram. The indicator is used to provide a clue to a computer term. The object of the game is to correctly identify the term.

In the example screen shown below the indicator would be marking the abacus shown in the diagram. At the bottom of the screen a prompt consisting of empty boxes shows the number of letters in the word. If the student playing the game does not know the term the best strategy is to guess letters. A letter can be played by typing the desired letter on the keyboard.

Computer Concepts

Sample Screen from the Identification Game



As correct letters are played the prompt line changes to show the position of the letters in the term. For example, in the term 'abacus', there are two places where the letter 'a' occurs. If the letter 'a' were played for this term, the letter would be filled in for all occurrences. The prompt would show the positions of the letter 'a' in the term 'abacus'.

Bonus points can be earned for entering a term correctly without guessing any letters. To select "Bonus" when the option is shown on the screen press the [/?] key. After the "Bonus" option has been selected the user is prompted to input the entire term. Enter the term using the keyboard and press the return key. If the term is entered correctly 10 bonus points are awarded. If the term was entered incorrectly the "Bonus" option is deactivated and the bonus opportunity is no longer available for this term.

The game is continued by identifying terms until all the terms for the selected topic have been entered. Press the Escape key to stop the Identification Game before completing all the terms.

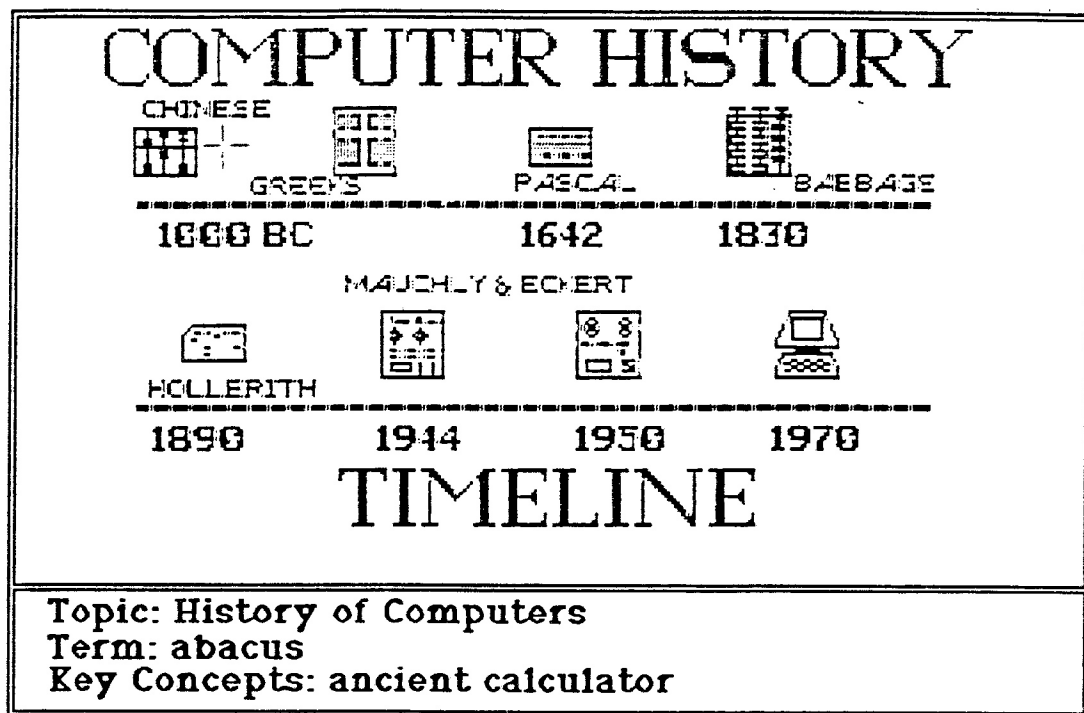
Data Retrieval Utility

The Data Retrieval Utility gives access to the detailed information on the topic that has been selected from the Topic Menu. Topics cannot be changed during the use of the Data Retrieval Utility. In order to change topics the user must press the escape key to exit from the Data Retrieval

Utility, select a different topic from the Topic Menu and then return to the Data Retrieval Utility.

The Data Retrieval Utility can be used in a variety of ways. It can be used to help students remember terms and key concepts, and is a useful way to study the terms and key concepts for a specific topic in preparation for using the Identification Game or the Quiz Machine.

The Data Retrieval Utility sequentially presents the terms and key concepts for the selected topic and provides the student with direct access to a more complete description.



When the Data Retrieval Utility is selected a graphic screen is displayed. At the bottom of the screen the term and key concept are presented. The indicator on the screen marks a part of the graphic which illustrates the term or key concept that is shown in the lower part of the screen. Use the arrow keys to move the indicator to different parts of the graphic. To stop using the Data Retrieval Utility press escape.

Accessing a Description

To read a description about the term and key concepts press the return key. Press the spacebar to restore the graphic screen.

Computer Concepts

Topic: History of Computers

Term: abacus

Key Concepts: ancient calculator

The abacus was one of the first tools used to express quantities and perform calculations. The first abacus was used by the Chinese more than 5000 years ago. These primitive computers were made from wood and beads. The use of the abacus spread to many other countries and is still used today as means of keeping track of numbers.

Quiz Machine

The Quiz Machine provides an opportunity to practice associating terms and key concepts. The program will randomly select and display a key concept and prompt the user to select the correct term to associate with the key concept. The terms used in the quiz are determined by the selection that has been made from the Topics Menu. Topics cannot be changed during the quiz.

To select a term use the arrow keys to move the indicator to the term and press the return key. Once an answer has been selected by pressing return it is immediately scored and the percent correct is shown. The program is motivating because students will see their percentage rating increase or decrease instantly after an answer is selected. The student can ask for help in answering a question by pressing the "H" key during the quiz to get clues to the answer before answering. Selecting help does not affect the percentage rating since the quiz is meant to be a learning experience.

Quiz: History of Computers

Match term with key concept.

abacus

- A. Greek calculator**
- B. first commercial computer**
- C. ancient calculator**

Enter answer:

Press the escape key to stop using the Quiz Machine before reaching the last question for a specific topic.

Supplementary Materials

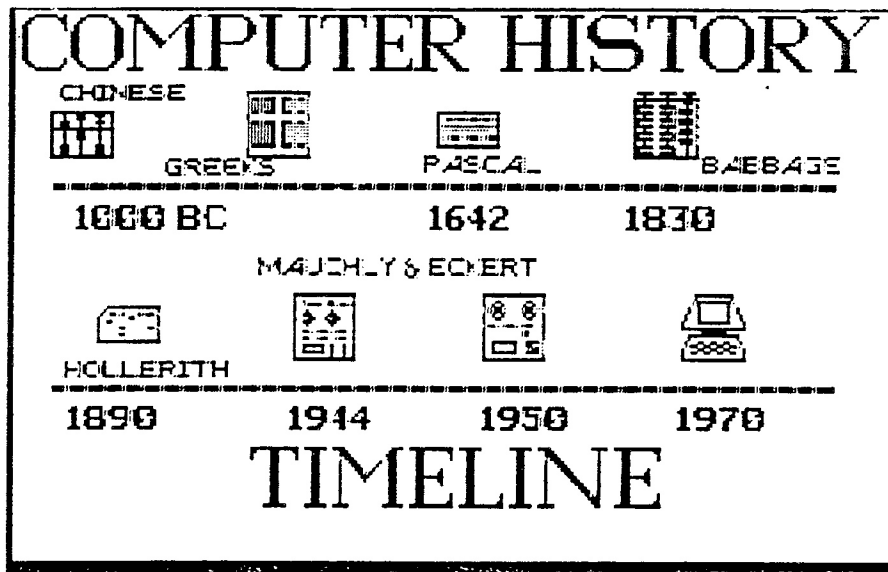
Reproducible black-line masters are provided for classroom use. Each worksheet is designed to be used in conjunction with a particular topic. The worksheets provide directions for the student and can be used along with the use of the computer or as a follow-up to a computer activity.

Name _____ Date _____

Activity #1

Computer Concepts: Computer History

Complete this activity using the Data Retrieval Utility. Select Computer History from the Topic Menu and study the terms and key concepts represented. In the spaces below write the names of the significant devices that are a part of the history of computers. Label the diagram by placing the corresponding letter on the device.



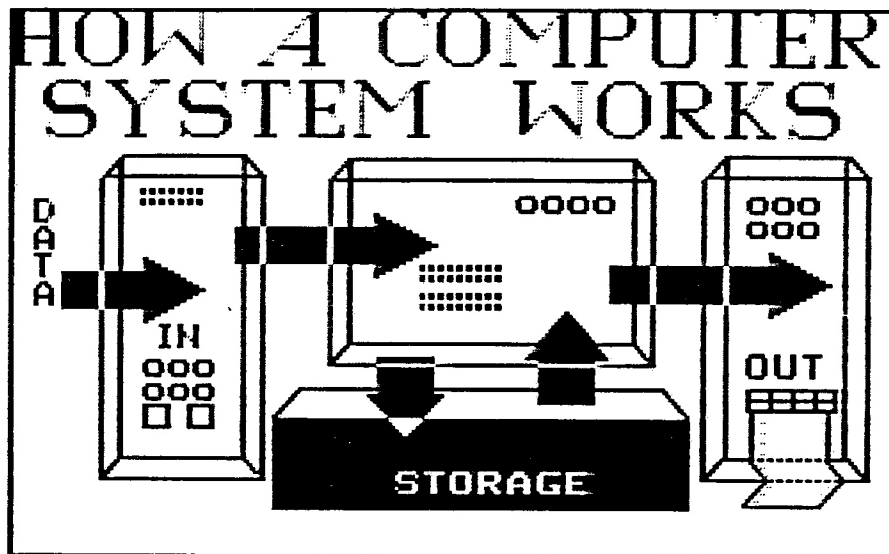
Terms:

- | | |
|----------|----------|
| A. _____ | B. _____ |
| C. _____ | D. _____ |
| E. _____ | F. _____ |
| G. _____ | H. _____ |

Name _____ Date _____

Activity #2 Computer Concepts: How a Computer System Works

Complete this activity using the Data Retrieval Utility. Select How a Computer System Works from the Topic Menu and study how the parts of a computer work together to process data. In the spaces below write the terms that are presented and label the drawing by placing the corresponding letter on the device.



Terms:

A. _____

B. _____

C. _____

D. _____

Name _____ Date _____

Activity #3 Computer Concepts: BASIC Programming Statements

Complete this activity using the Data Retrieval Utility. Select BASIC Programming Statements from the Topic Menu and read about how the statements and concepts are used in programming. Label the graphic to show each example of a programming statement or concept.

```
BASIC STATEMENTS
10 REM PHONE LIST
20 LET N$="":REM NAME
30 LET P$="":REM PHONE NUMBER
40 LET C=0:REM COUNTER
50 READ N$,P$
60 IF N$="EOF" THEN END
70 LET C=C+1
80 PRINT C;". ";N$;" ";P$
90 READ N$,P$
100 GOTO 60
110 DATA "JANE DOE","805-498-8365"
120 DATA "JOHN SMITH","213-785-7229"
130 DATA "EOF","0"
```

Terms:

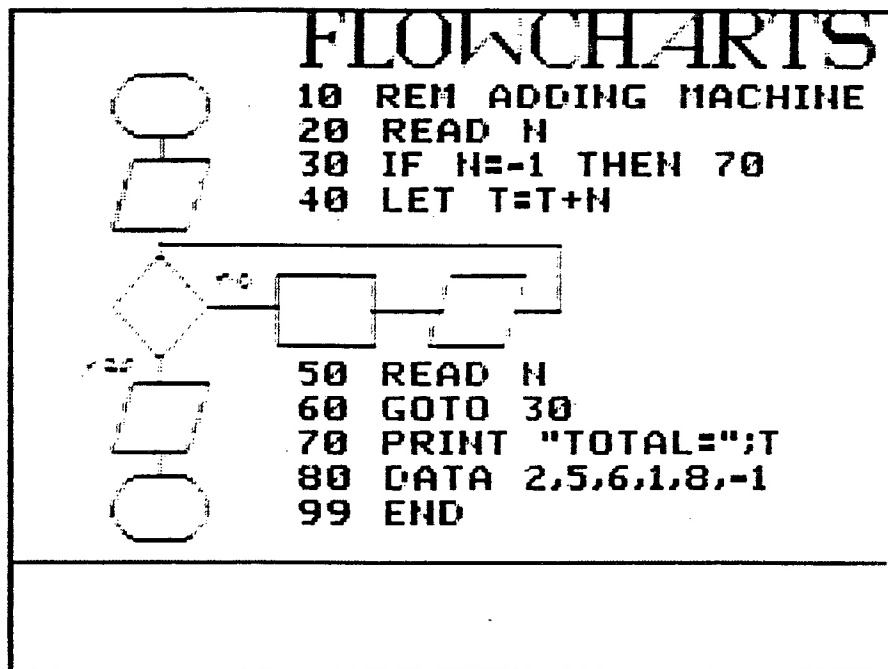
- | | |
|----------|----------|
| A. _____ | B. _____ |
| C. _____ | D. _____ |
| E. _____ | F. _____ |
| G. _____ | H. _____ |
| I. _____ | J. _____ |
| K. _____ | L. _____ |
| M. _____ | |

Name _____ Date _____

Activity #4

Computer Concepts: Understanding Flowcharts

Complete this activity using the Data Retrieval Utility. Select Understanding Flowcharts from the Topic Menu and study the terms and key concepts represented. In the spaces below write the terms that are presented and label the example of a flowchart with the letter for the corresponding term.



Terms:

A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

G. _____

H. _____

I. _____

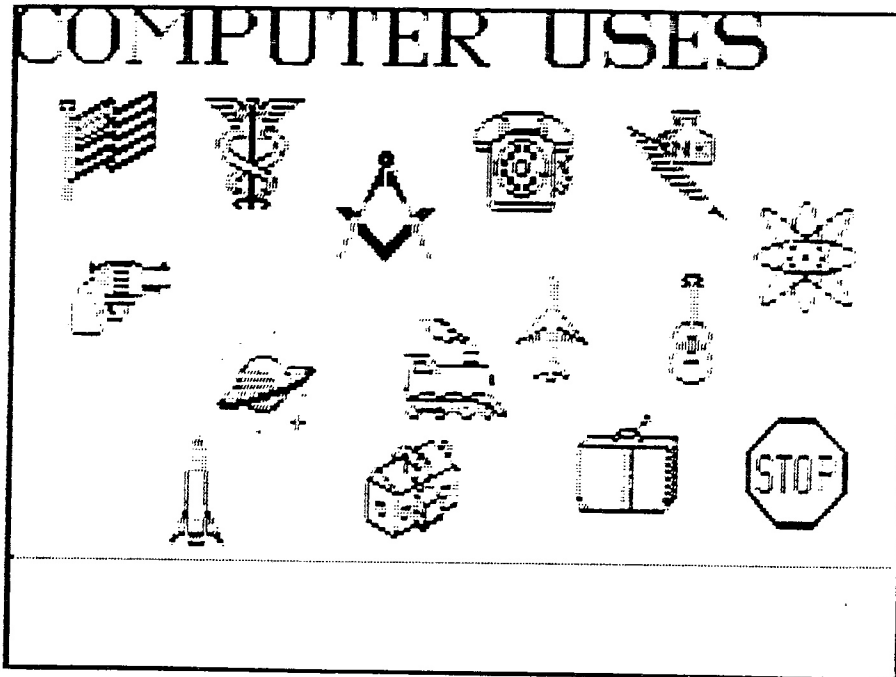
J. _____

Name _____ Date _____

Activity #5

Computer Concepts: Computer Uses

Complete this activity using the Data Retrieval Utility. Select Computer Uses from the Topic Menu and study the variety of ways that people use computers. In the spaces below write the terms that are presented and label the pictures with the corresponding letter.



Terms:

A _____

B. _____

C. _____

D. _____

E. _____

F. _____

G. _____

H. _____

I. _____

J. _____

K. _____

L. _____

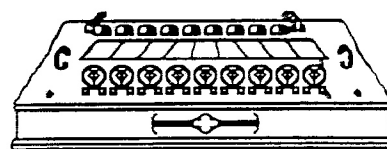
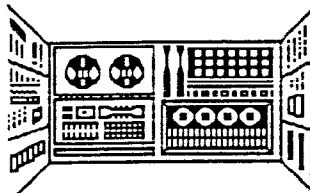
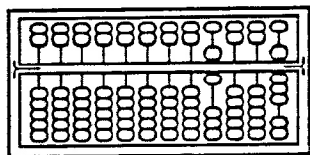
M. _____

Name _____ Date _____

Activity #6

Computer History Match-Up

Match a device given on the left with the clues given in the column on the right.



A. abacus

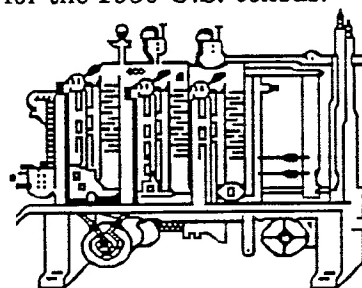
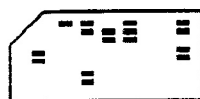
_____ This machine was designed by an English inventor and was the first device that was able to follow a simple set of instructions.

B. UNIVAC

_____ This device was invented by a French mathematician and used wheels and gears to represent numbers.

C. Pascal's Machine

_____ This huge machine was the first computer sold commercially. It was used for the 1950 U.S. census.



D. counting tablet

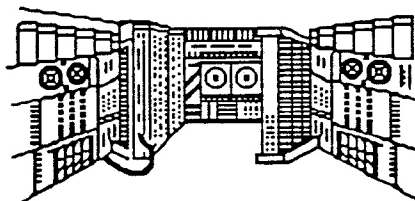
_____ This computer uses integrated circuits and is much more powerful than the early computers.

E. punched card

_____ This huge machine was the first digital computer. It used over 18,000 vacuum tubes.

F. Analytical Engine

_____ This ancient device was one of the first tools used to express numbers and perform calculations. In some parts of the world it is still in use today.



G. ENIAC

_____ This simple device was used in 1890 by the U.S. Government for the census.

H. microcomputer

_____ The ancient Greeks are credited with the invention of this device for working with numbers. It consisted of a table top with grooves. Beads or small stones were used to represent numbers.

Name _____ Date _____

Activity #7

How a Computer System Works

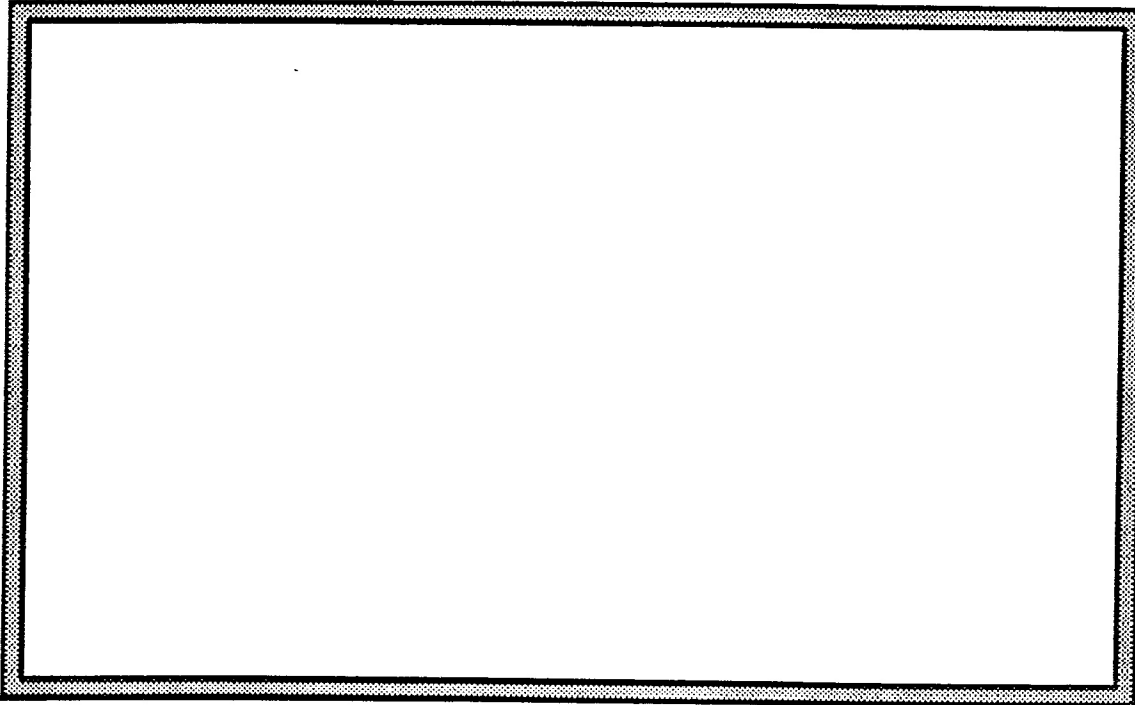
Each of the devices listed below can be used on a computer system. In the spaces provided give the function of each device listed. Use the Data Retrieval Utility on How a Computer System Works to help you complete this activity.

I=input device
P=processor
M=Memory
O=output device
I/O=Input/Output device

| | | | | | |
|------------|-------|------------|-------|-------------|-------|
| Modem | ----- | Printer | ----- | Joystick | ----- |
| Light Pen | ----- | Disk Drive | ----- | Card Reader | ----- |
| CPU | ----- | Mouse | ----- | Monitor | ----- |
| Microphone | ----- | Speaker | ----- | Camera | ----- |
| Keyboard | ----- | Plotter | ----- | Diskette | ----- |

Design Your Own Computer System

Make a drawing of a computer system. Include at least one input device, a central processing unit, and an output device.



Name _____ Date _____

Activity #8**BASIC Programming Statements**

In this activity, fill in the blank spaces to correctly complete the sentences. Use the Data Retrieval Utility as a source for information.

1. A _____ gives a name to a section of the program.
2. The _____ command is always used with a data statement. This command stores data that is given by the data statement in memory where it can be used by the program.
3. The statement that creates a decision point in a program is called an _____.
4. A statement in a program that repeatedly adds one to a variable is an example of a _____.
5. A GOTO command sends control directly to another part of the program. It is an example of an _____ branch.
6. Many programs are written so that a loop continues to read data until all the data is read. The characters EOF are used to mark the end of the data and stand for _____.
7. The first part of a program where values are assigned to variables is called the _____ section.
8. A _____ is used to clarify the purpose of each of the various parts of a program.
9. A _____ is used in a program to hold the words and numbers that are to be processed by the program.
10. Storing a word in a variable as its first value is called _____. Storing a number in a variable as its first value is called _____.

Name _____ Date _____

Activity #9

Drawing a Flowchart

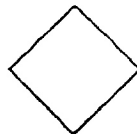
Shown below are four symbols commonly used in making a flowchart. In the activity you will make a flowchart to show how to do a particular task.



Start/Stop



Input/Output



Decision



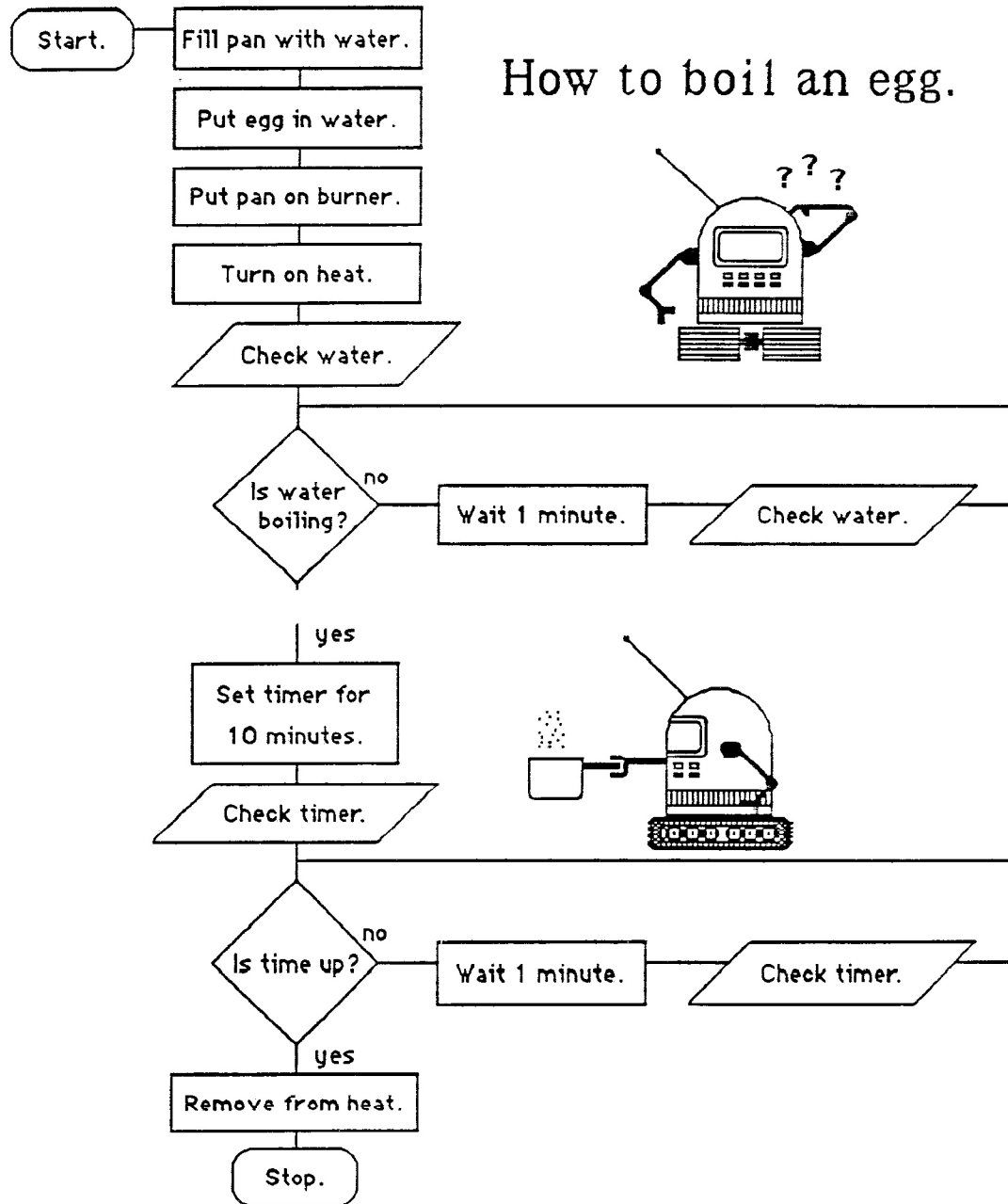
Process

On the next page is an example of a flowchart that explains how to make a hard boiled egg. Choose one of the tasks listed below and draw a flowchart to explain how to do the task.

1. How to make popcorn.
2. How to ride a bike.
3. How to answer the telephone.
4. How to call a friend on the telephone.
5. How to take care of a pet.
6. How to make lemonade.
7. How to make a paper airplane.
8. How to brush your teeth.
9. How to eat pizza.
10. How to catch a baseball.

Name _____ Date _____

Here is an example of a flowchart on how to boil an egg. Study the flowchart and notice how ovals are used for start and stop. Rectangles are used for processes. Parallelograms are used for input or output operations and diamonds are used for decisions.



Name _____ Date _____

Activity #10

Scrambled Computer Uses

Unscramble the letters to spell each of the computer uses described below.

1. A doctor in a hospital might use a computer to do this for a patient.

o r i t n m o
t i a l v
o c d o i n t i n s

2. The telephone company and other communications companies use computers to direct the millions of calls that are made each day. Computers are used for this reason.

d s n i c a e e r
e p s d e

3. Your local police department probably uses computers for this purpose.

i m c n l a i r
r c r e d s o

4. One of the many ways that a business uses a computer is for this reason.

c u t g a c n o i n

5. Traffic is a problem in many large cities. Computer are used in this way to help ease the problem.

e a r g l u e t
r a f t c i f
h s t i g l

Name _____ Date _____

Activity #11

Computer Uses: What Do You Think?

Use the Data Retrieval Utility to read about the many uses of computer. Write answers to these questions and tell what you think. Use complete sentences.

There have been many wonderful achievements in the American Space Program. Men have walked on the moon. Mars has been explored. Probes have been sent to photograph the planets. Could these achievements have been possible without computers? Explain your answer.

Do you have a computer in your home? What are some of the things that you could do with a computer at home?

Imagine that you are flying from Los Angeles to New York. Name three ways that the airlines would use computers to make your trip possible.

What are some of the ways that a person who is designing a building could use a computer?

How might computers be used at a nuclear power plant?

How could a musician use computers?

Name _____ Date _____

Activity #12

System Components and Peripherals

Classify each device that you have on your computer system as an input device, output device, processing device or memory device by writing the name of the component or peripheral in the space below each category name. If the device could be in two categories write it twice.

INPUT

PROCESSING

OUTPUT

MEMORY

Answers

Activity #1

- | | |
|---------------------|--------------------|
| A. abacus | B. counting tablet |
| C. Pascal's machine | D. analytic engine |
| E. punched card | F. ENIAC |
| G. UNIVAC | H. microcomputer |

Activity #2

- | | |
|----------------|----------------|
| A. input unit | B. CPU |
| C. output unit | D. memory unit |

Activity #3

- | | |
|-------------------------|-------------------------|
| A. line number | B. remark |
| C. comment | D. initializing string |
| E. null string | F. initializing numeric |
| G. read statement | H. conditional branch |
| I. counter | J. print statement |
| K. unconditional branch | L. data statement |
| M. end of file | |

Activity #4

- | | |
|-------------|--------------------|
| A. start | B. input |
| C. decision | D. processing |
| E. loop | F. output |
| G. end | H. true |
| I. false | J. connecting line |

Activity #5

- | | |
|-------------------|---------------------|
| A. government | B. medicine |
| C. drafting | D. communication |
| E. wordprocessing | F. law enforcement |
| G. space program | H. home |
| I. transportation | J. electronic music |
| K. atomic energy | L. traffic control |
| M. business | |

Activity #6

F, C, B, H, G, A, E, D

Activity #7

| | | |
|--------------|----------------|---------------|
| Model I/O | Printer O | Joystick I |
| Light Pen I | Disk Drive I/O | Card Reader I |
| CPU P | Mouse I | Monitor O |
| Microphone I | Speaker O | Camera I |
| Keyboard I | Plotter O | Diskette M |

Activity #8

1. remark
2. read
3. if then
4. counter
5. unconditional
6. end of file
7. initialization
8. comment
9. data statement
10. initializing a string, initializing a numeric

Activity #10

1. monitor vital conditions
2. increased speed
3. criminal records
4. accounting
5. regulate traffic lights

Activity #12

(Answers will vary)

Input keyboard, light pen, joystick, camera, disk drive

Processing CPU

Output video screen, printer, plotter, disk drive

Memory diskette